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```
(derivative <near/4> (mean
<or> average)) <and> (black
<or> dark)
```

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```
(derivative <near/4> (mean
<or> average)) <and>
(gradation <or> normali*)
```

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```
(dark* <or> black*) <near/3>
(area <or> region) <and>
(image <or> normali* <or>
gradation <or> enhanc*)
```

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Blotches correction and contrast enhancement for old film pictures

Tenze, L. Ramponi, G. Carrato, S.
Dipartimento di Elettrotecnica Elettronica ed Inf., Trieste Univ., Italy;
This paper appears in: **Image Processing, 2000. Proceedings. 2000 International Conference on**

Abstract:
A complete system for old picture restoration is described: in particular, a frame alignment method, a simple deblotching algorithm and a nonlinear approach for contrast **enhancement** are proposed. The frame alignment uses a global motion compensation, with a logarithmic search for the correction vector. The blotch removal step consists of two stages. Blotches are first detected using two suitable morphological operators; the resulting pixel maps are merged and then validated using an estimate of the motion. Secondly, a multilevel median filter is used to replace sets of pixels identified as blotches. For contrast **enhancement** we use a rational unsharp masking technique which is able to effectively treat the high resolution **images**. To comply with the film properties the sharpening operator acts strongly in the **dark regions** and weakly in the bright ones. It can also reduce noise in homogeneous areas

Index Terms:
cinematography   filtering theory   **image enhancement**   **image** resolution   **image** restoration   mathematical morphology   mathematical operators   median filters   motion compensation   motion estimation   blotches correction   bright regions   contrast **enhancement**   correction vector   **dark regions**   deblotching algorithm   film properties   frame alignment method   global motion compensation   high resolution **images**   logarithmic search   morphological operators   motion estimation   multilevel median filter   noise reduction   nonlinear approach   old film pictures   old picture restoration   pixel maps   rational unsharp masking   sharpening operator

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L3	4	1 and 2	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:24
L4	122692	(minimum or min$3) near3 (region$1 or area$1 or neighborhood$1 or section$1 or part$1 or portion$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:06
L5	25466	(darkness or darkest or dark or blackness or blackest or (black adj value$1)) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:35
L6	23	4 and 1	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:52
L7	81	4 and 382/274.ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:06
L8	75240	(minimum or min or minima) near3 (region$1 or area$1 or neighborhood$1 or section$1 or part$1 or portion$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:35
L9	73	8 and 382/274.ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:23
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L14	162	13 and (normali$6 or gradation)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:56
L15	151	14 not (3 or 6 or 7)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:30

L16	3415	(darkness or darkest or dark or blackness or blackest or (black adj value$1)) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1)	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/12/02 13:35
L17	19469	(minimum or min or minima) near3 (region$1 or area$1 or neighborhood$1 or section$1 or part$1 or portion$1)	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/12/02 13:36
L18	19	16 and 17	EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/12/02 13:36
L19	257	13 and (contrast)	US-PGPUB; USPAT	OR	OFF	2004/12/02 13:56
L20	46	13 and (contrast near2 enhanc$5)	US-PGPUB; USPAT	OR	OFF	2004/12/02 14:11
L21	1	("3,983,320").PN.	US-PGPUB; USPAT	OR	OFF	2004/12/02 14:11
S1	1	("20020146171").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:31
S2	19	(("2404138") or ("3520689") or ("3520690") or ("3587435") or ("3615479") or ("3615498") or ("3617282") or ("3747120") or ("3903541") or ("3946398") or ("3959048") or ("4026756") or ("4081577") or ("4142107") or ("4215927") or ("4249985") or ("4301469") or ("4490729") or ("4501480")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:36
S3	19	(("4564280") or ("4594598") or ("4621037") or ("4623236") or ("4636808") or ("4666307") or ("4670779") or ("4736221") or ("4745040") or ("4755844") or ("4777102") or ("4796061") or ("4814630") or ("4821114") or ("4845551") or ("4851311") or ("4857430") or ("4875067") or ("4969045")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:39

S4	19	(("4994918") or ("5034767") or ("5101286") or ("5124216") or ("5155596") or ("5196285") or ("5212512") or ("5231439") or ("5235352") or ("5255408") or ("5266805") or ("5267030") or ("5292605") or ("5296923") or ("5350651") or ("5350664") or ("5357307") or ("5360701") or ("5371542")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:40
S5	19	(("5391443") or ("5414779") or ("5416550") or ("5418119") or ("5418597") or ("5432579") or ("5436738") or ("5440365") or ("5447811") or ("5448380") or ("5452018") or ("5465155") or ("5516608") or ("5546477") or ("5496669") or ("5550566") or ("5519510") or ("5552904") or ("5563717")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:41
S6	19	(("5568270") or ("5576836") or ("5581376") or ("5596415") or ("5627016") or ("5664253") or ("5664255") or ("5667944") or ("5678116") or ("5691118") or ("5695914") or ("5698382") or ("5726773") or ("5739897") or ("5771107") or ("5790277") or ("5835811") or ("5870172") or ("5880819")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:42
S7	20	(("5892595") or ("5930388") or ("5963662") or ("5966465") or ("5979011") or ("5982936") or ("5982937") or ("5982941") or ("5982951") or ("5988896") or ("5991444") or ("5998109") or ("6000284") or ("6005987") or ("6065824") or ("6069714") or ("6089687") or ("6101273") or ("6102508") or ("6137965")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:43
S8	15	(("3833161") or ("4265545") or ("4633300") or ("4741621") or ("5027146") or ("5200817") or ("5334247") or ("5477345") or ("5587752") or ("5627016") or ("5649260") or ("5835795") or ("5959720") or ("6088084") or ("6200738")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2004/09/09 12:44
S9	12	WO-9001240-$.did. WO-9109493-$.did. WO-9725652-$.did. WO-9819216-$.did. WO-9825399-$.did. WO-9831142-$.did. WO-9834157-$.did.	EPO; DERWENT	OR	OFF	2004/09/09 12:57

S10	4	WO-9834397-$.did. WO-9943148-$.did. WO-0101197-$.did. WO-0113174-A1.did. EP-0261782-A2.did. EP-0422220-A1.did. EP-0482790-B1.did. EP-0525886-A3.did. EP-0580293-A1.did. EP-0669753-A2.did.	EPO; DERWENT	OR	OFF	2004/09/09 13:00
S11	4	WO-9834397-$.did. WO-9943148-$.did. WO-0101197-$.did. WO-0113174-$.did. EP-0261782-$.did. EP-0422220-$.did. EP-0482790-$.did. EP-0525886-$.did. EP-0580293-$.did. EP-0669753-$.did.	EPO; DERWENT	OR	OFF	2004/09/09 13:01
S12	4	"261782".pn.	DERWENT	OR	OFF	2004/09/09 13:09
S13	1	EP-261782-$.did.	DERWENT	OR	OFF	2004/09/09 13:05
S14	6	EP-261782-$.did. EP-422220-$.did. EP-482790-$.did. EP-525886-$.did. EP-580293-$.did. EP-669753-$.did.	DERWENT	OR	OFF	2004/09/09 13:06
S15	2	EP-794454-$.did. EP-930498-$.did.	DERWENT	OR	OFF	2004/09/09 13:07
S16	8	WO-9825399-$.did. WO-9834157-$.did. WO-9943149-$.did. WO-0145042-$.did. WO-0150192-$.did. WO-0150193-$.did. WO-0150194-$.did. WO-0150197-$.did. WO-0152556-$.did. EP-580293-$.did. EP-601364-$.did. EP-768571-$.did. EP-806861-$.did. EP-878777-$.did.	DERWENT	OR	OFF	2004/09/09 13:12
S17	8	WO-9825399-$.did. WO-9834157-$.did. WO-9943149-$.did. WO-145042-$.did. WO-0150192-$.did. WO-0150193-$.did. WO-0150194-$.did. WO-0150197-$.did. WO-0152556-$.did. EP-580293-$.did. EP-601364-$.did. EP-768571-$.did. EP-806861-$.did. EP-878777-$.did.	DERWENT	OR	OFF	2004/09/09 13:20
S18	6	WO-200145042-$.did. WO-200150192-$.did. WO-200150193-$.did. WO-200150194-$.did. WO-200150197-$.did. WO-200152556-$.did.	DERWENT	OR	OFF	2004/09/09 13:16

S19	14	(WO-9825399-$.did. WO-9834157-$.did. WO-9943149-$.did. WO-145042-$.did. WO-0150192-$.did. WO-0150193-$.did. WO-0150194-$.did. WO-0150197-$.did. WO-0152556-$.did. EP-580293-$.did. EP-601364-$.did. EP-768571-$.did. EP-806861-$.did. EP-878777-$.did.) or (WO-200145042-$.did. WO-200150192-$.did. WO-200150193-$.did. WO-200150194-$.did. WO-200150197-$.did. WO-200152556-$.did.)	DERWENT	OR	OFF	2004/09/09 13:16
S20	3088	(uniform or constant or stable or consistent) near4 (gray$6 or grey$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 13:48
S21	520	((uniform or constant or stable or consistent) near4 (gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:08
S22	58	(((uniform or constant or stable or consistent) near4 (gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)) same (((black$4 or darkness or min or minim$3 or max or maxim$3 or lowest or highest or greatest) near2 (value$1 or level$1 or gray$6 or grey$1)) or darkest or blackest)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 13:49
S23	460	homogeneous near4 (pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:06
S24	161	(homogeneous near4 (pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 13:49

S25	3	((homogeneous near4 (pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)) same (((black$4 or darkness or min or minim$3 or max or maxim$3 or lowest or highest or greatest) near2 (value$1 or level$1 or gray$6 or grey$1)) or darkest or blackest)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:05
S26	16018	(average or mean or median) near3 (pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:08
S27	22216	(average or mean or median) near3 (brightness or luminance or pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:08
S28	7213	((average or mean or median) near3 (brightness or luminance or pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:24
S29	713	(((average or mean or median) near3 (brightness or luminance or pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)) and ((normali$6 or calibrat$3 or dark$4 or black$4) near4 (mean or average or median))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:21
S30	327	(((average or mean or median) near3 (brightness or luminance or pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)) same ((normali$6 or calibrat$3 or dark$4 or black$4) near4 (mean or average or median))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:24

S31	5543	((average or mean or median) near3 (brightness or luminance or pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near3 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:24
S32	246	(((average or mean or median) near3 (brightness or luminance or pixel$1 or pel$1 or (picture adj element$1) or gray$6 or grey$6)) near3 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)) same ((normali$6 or calibrat$3 or dark$4 or black$4) near4 (mean or average or median))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2004/09/09 14:25
S33	23706	(mean or average) near2 (gray$6 or grey$6 or ((pixel or pel or (picture element)) adj value$1) or intensit$3 or brightness$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S34	4409	(mean or average$1) near3 derivative$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:01
S35	71	S33 and S34	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:23
S36	40095	(uniform or stable or constant or consistent) near2 (gray$6 or grey$6 or ((pixel or pel or (picture element)) adj value$1) or intensit$3 or brightness$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:46
S37	6111	S36 near6 (region$1 or area$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:46
S38	40237	(uniform or stable or constant or consistent or homogenous) near2 (gray$6 or grey$6 or ((pixel or pel or (picture element)) adj value$1) or intensit$3 or brightness$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:46

S39	6137	S38 near6 (region$1 or column$1 or row$1 or neighborhood$1 or section$1 or part$1 or portion$1 or block$1)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:47
S40	185	S39 same ((((black$4 or darkness or min or minim$3 or max or maxim$3 or lowest or highest or greatest) near2 (value$1 or level$1 or gray$6 or grey$1)) or darkest or blackest)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 14:48
S41	897	(median) near2 (gray$6 or grey$6 or ((pixel or pel or (picture element)) adj value$1) or intensit$3 or brightness$2 or luminance)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S42	43	(median) near3 derivative$1	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S43	0	S41 and S42	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 15:26
S44	4125	((382/181,190,195,206,272,274,173, 180) or (358/504,406)).CCLS.	US-PGPUB; USPAT	OR	OFF	2004/11/27 16:50
S45	10	(S34 or S42) and S44	US-PGPUB; USPAT	OR	OFF	2004/11/27 16:51
S46	6	S45 not S35	US-PGPUB; USPAT	OR	OFF	2004/11/27 16:51
S47	3637	(mean or average$1 or median) near3 slope	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:01
S48	197	S33 and S47	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:02

S49	58	S33 same S47	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2004/11/27 17:09
S50	916	(382/173,180).CCLS.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:11
S51	79851	(dark$3 or black$3 or lowest) near4 (portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1 or column$1 or row$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:16
S52	252	S50 and S51	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:15
S53	72511	(dark$3 or black$3 or lowest) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1 or column$1 or row$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S54	67206	(dark$4 or black$4) near4 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1 or column$1 or row$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S55	64277	(dark$4 or black$4) near4 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S56	246	S50 and S55	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:18
S57	26142	(darkness or darkest or dark or blackness or blackest) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1 or column$1 or row$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:19
S58	26169	(darkness or darkest or dark or blackness or blackest or (black adj value$1)) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1 or column$1 or row$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S59	72	S50 and S58	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:35
S60	651	segmentation and S58	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:36

S61	606	S60 not S59	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:35
S62	339	S61 and ("382"/$ or "358"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:36
S63	107	(segmentation or segmenting) same S58	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S64	74	S63 and ("382"/$ or "358"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S65	63	S64 not S59	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:38
S66	25377	(darkness or darkest or dark or blackness or blackest or (black adj value$1)) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:27
S67	103	(segmentation or segmenting) same S66	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:37
S68	70	S67 and ("382"/$ or "358"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:12
S69	59	S68 not S59	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:50
S70	1	("5,327,262").PN.	US-PGPUB; USPAT	OR	OFF	2004/11/29 11:50
S71	1651	((uniform$2 or constant or stable or consistent or flat) near (gray$6 or grey$6 or brightness$2 or intensit$3 or luminance)) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S72	286	S71 and S66	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S73	76	S72 and ("382"/$ or "358"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S74	1123	(homogenous) near3 (segment$1 or portion$1 or region$1 or area$1 or partition$1 or subportion$1 or subregion$1 or subarea$1 or subpartition$1)	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S75	49	S74 and S66	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:38
S76	19	S75 and ("382"/$ or "358"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/11/29 12:39

S77	61	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region$1 or area$1 or neighborhood$1 or section$1 or part$1 or portion$1)	DERWENT	OR	OFF	2004/12/01 17:56
S78	1194	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region$1 or area$1 or neighborhood$1 or section$1 or part$1 or portion$1)	US-PGPUB; USPAT	OR	OFF	2004/12/02 12:23
S79	450	S78 and ("382"/$ or "358"/$ or "348"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:05
S80	1203	(darkest or blackest or ((most or highest or greatest) adj (black or dark))) near3 (region$1 or area$1 or neighborhood$1 or section$1 or part$1 or portion$1 or segment$1)	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:04
S81	198	S80 and (normali$6)	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:05
S82	110	S81 and ("382"/$ or "358"/$ or "348"/$).ccls.	US-PGPUB; USPAT	OR	OFF	2004/12/01 18:05